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Summary

Executive summary

This thesis aims to contribute to the knowledgebase of Lean practice and Lean leadership in healthcare and to provide a resource for those contemplating Lean transformation in this sector. The thesis comprises the following sections: Introduction (Chapter 1), Original studies (Chapters 2-7) and Discussion (Chapter 8).

Introduction (Chapter 1)

- This chapter describes the origins of Lean practice in the Japanese car manufacturer Toyota and the more recent introduction of Lean practice into healthcare. We present a 'roadmap' to successful Lean implementation, which predicts areas of tension and implementation challenges when applied to a hospital setting. Gaps in the Lean healthcare literature are identified, which include: how to measure the effectiveness of Lean transformation; what facilitates the implementation of Lean healthcare; a need for studies that examine the complex dynamics of Lean transformation; what factors contribute to overcoming the 'knowing-doing gap' in healthcare; and the characterisation of Lean leadership in relation to established leadership models.
- Our research questions were developed from this background. How can healthcare organisations benefit from Lean practice? How can we better understand the complex interactions and cultural implications of Lean transformation in healthcare? How can Lean leadership help to overcome organisational barriers and contribute to effective implementation of Lean practice? What facilitators and barriers to the implementation of Lean healthcare can be identified and how may leaders use knowledge of facilitators and barriers to make the transformation process successful? How can Lean leadership be defined and what are characteristics of effective Lean leadership in comparison with existing leadership models? Finally, what tools are useful and what can be learned from case studies on Lean implementation in healthcare?

- Lean philosophy, Lean leadership and Lean tools are discussed in the context of the development of a theoretical framework, and the six original studies to be presented in subsequent chapters are summarised.

Original studies (Chapters 2-7)

- In Chapters 2-7, we present our original studies. In three case studies, examples of the implementation of Lean practice in healthcare are investigated. A further three studies focus on the complex dynamics of Lean transformation, factors influencing the implementation of Lean in healthcare and the characterisation of Lean leadership.
- In Chapter 2, A3 reporting and a fishbone analysis used by a multidisciplinary team to reduce operating department (OD) scrub room door movements are discussed. In Chapter 3, the use of Makigami alongside a fishbone analysis to reduce nurse scheduling errors in the OD is presented. Chapter 4 addresses Value Stream Mapping and shows it reduced the delay between diagnosis and surgical treatment for patients with oesophageal cancer.
- In Chapter 5, a survey-based methodology was employed to identify factors which influenced the transformation process after implementation of Lean practices in an operating theatre. These include the degrees of: transformational leadership, team leadership and workforce flexibility. Semi-structured, in-depth interviews with healthcare professionals who were directly involved with Lean implementation were analysed in Chapter 6 to identify barriers and facilitators to the implementation of Lean healthcare in hospitals. In Chapter 7, key Lean leadership behaviours and qualities were identified, including the empowerment of employees, going to the *gemba* and demonstrating humility by managers.

Discussion (Chapter 8)

- The discussion first summarises the main messages from the studies, and their relationship to the Transition-to-Lean Roadmap. Next, barriers and facilitators to successful Lean implementation are considered individually, and compared with findings in other studies. These include: training and

education; senior management support (and involvement) alongside the provision of necessary resources; communication of strategy and purpose; resistance to change; multidisciplinary collaboration; and the overcoming of functional and professional silos.

- As practical tools for the Lean implementer, tensions are identified: time for training and education vs. other commitments; the importance of senior and middle management involvement; single discipline autonomy vs. multidisciplinary approach; departmental autonomy (silo) vs. cross-departmental working; alignment of incentives between multiple stakeholders; employee resistance to change; and employees acceptance of managers when they go to the *gemba*.
- Lean leadership style is further characterised through comparison with traditional leadership styles reviewed earlier in the thesis.
- In conclusion, we summarize critical success factors for the implementation of Lean practice in healthcare, synthesised from the studies presented in combination with the literature.